

ICAO Regional Seminar Maputo 24th to 26th November 2010

ICAO MRTD & eMRTD Standards & Specifications

Presenter

Malcolm Cuthbertson

De La Rue ID Systems

ISO

Agenda

- Role of ICAO
- Chicago Convention 1944
- Doc 9303
 - >Part 1 MRPs
 - >Part 2 Visas
 - Part 3 Travel cards

International standards













osce

Evolution of MRTD

- Annex 9 to the Chicago convention of 1944
- 1968 ICAO start work on MRTD standards.
- 1980 First edition of Doc 9303
- First MRP issued in 1981
- Standards evolved over nearly 3 decades
- Balance between facilitation and security
- Cultural considerations:
 - > Transliteration
 - > Flexibility in VIZ
- First introduction of ePassport 2004

Chapter 3. of Annex 9

Contracting States:

- Shall not extend the validity of their MRTDs
- Shall issue a separate passport to each person, regardless of age
- Validity. At least 5 years. Not more than 10 yrs
- Shall begin issuing only MRPs no later than 1 April 2010
- Shall make provision for encoded data to be revealed to the holder of the document
- Non MR passports issued after 24 Nov 2005 shall ensure that the expiration date falls before 24 Nov 2015. After 2015 all passports in circulation must be MRP

ICAO standards

- CAO DOCUMENT 9303 (Parts 1-3), Family of MRTDs:
 - Part 1: Machine Readable Passports (MRPs)
 - Volumes 1 & 2
 - Part 2: Machine Readable Visas (MRVs)
 - Part 3: Official Travel Documents (cards)
 - Volumes 1 & 2
- **SUPPLEMENT 8**

Intended benefits of MRTDs

To facilitate and secure passenger processing at border control pointsTo enable global interoperability



ICAO 9303 - status

- Structure of Document
- Supplements (8)

Part 1

Passports

Volume 1

MRP

w/o
add.
storage

Storage

6th edition tbp

Part 2
Visa

3rd edition 2005

Part 3
ID cards

Volume 1

MRTD

w/o
add.
storage

Storage

Capacity

3rd edition tbr

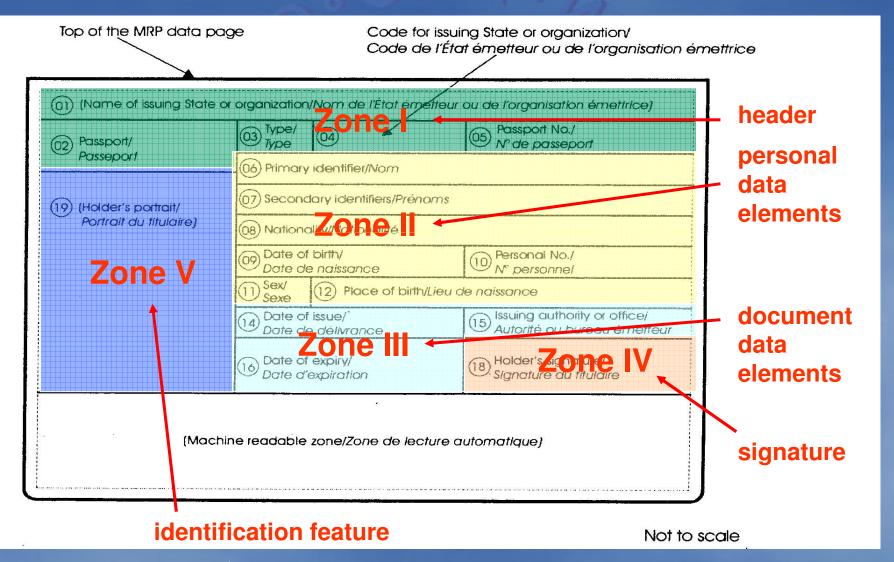
Data page layout



88mm

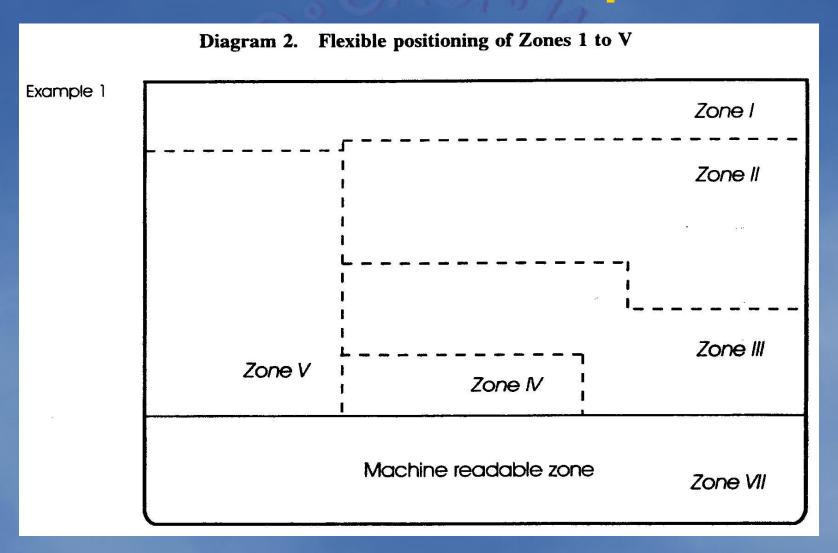
125mm

Visual inspection zone (VIZ)



Visual inspection zone (VIZ)







Field 13 – optional personal data elements (ghost image, fingerprint, etc) (VR)



Field 18 – Holder's signature or usual mark (VR), may be located in Zone VI (rear)

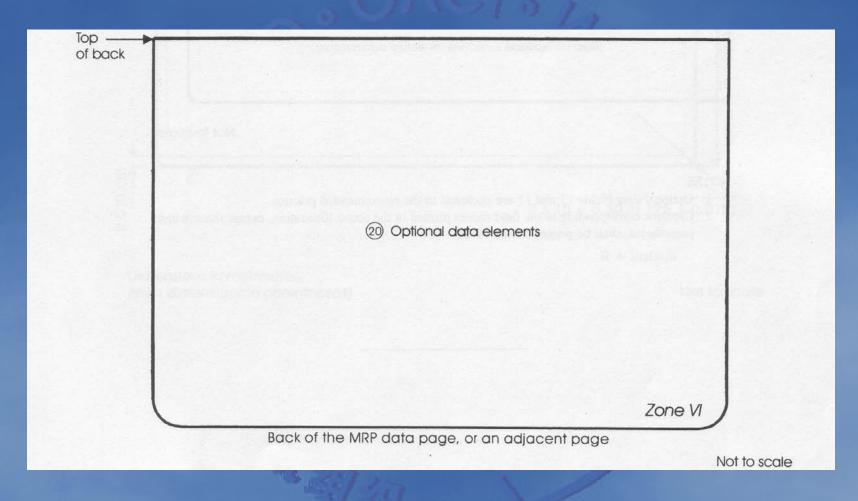


Data Feature - Digital Security





VIZ – zone VI



Machine readable zone (MRZ)

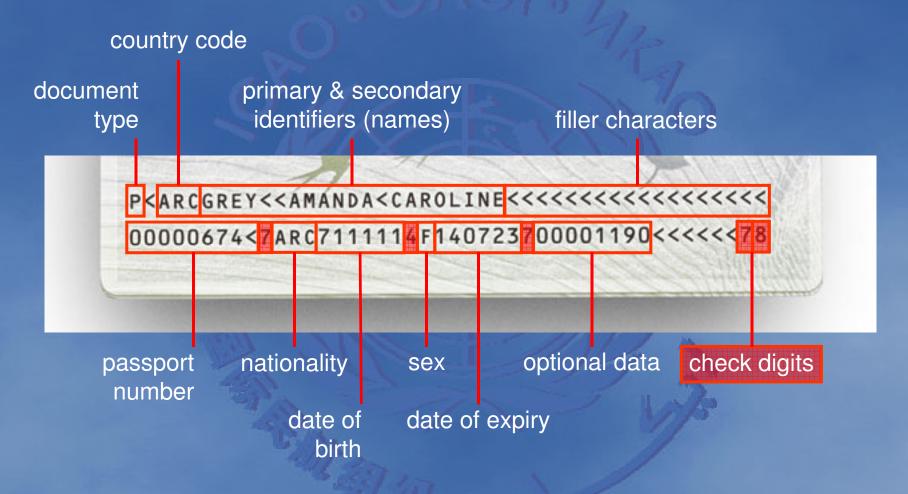


MRZ – OCR-B

"Machine readable information is contained in two lines of OCR-B text, each with 44 characters". ICAO Doc 9303, II-2

P<ARCGREY<<AMANDA<CAROLINE<<<<<<<<<>00000674<7ARC7111114F140723700001190<<<<<78

MRZ – OCR-B





Part 2 – Visa



- Interoperability a must? Airlines!
- 3 eVisa possibilities
 - >in visa label
 - in database (also supporting label)
 - in ePassport chip (future possibility)

Visas Why interoperability?

- International travel
- Border control 190 member states
- Airlines carriers' liability act
- Banks

Example of MRV-A

UTOPIA

VISA



Place of Issue/Lieu de deliverence Valid from/Valide a partir de

ZENITH

10DEC 91

10DEC 96

No. of Entries/Nombre d'entrees

MULTIPLE

Document No./Numero de document M123889546

Type/Type

BUSINESS MULTIPLE

Surname, Given names/Nom. Prenoms

ERIKSSON JOHN ARTHUR

Passport Number

L8988901C

M/M

07SEP 40 XXX

Signature of Issuing Officer

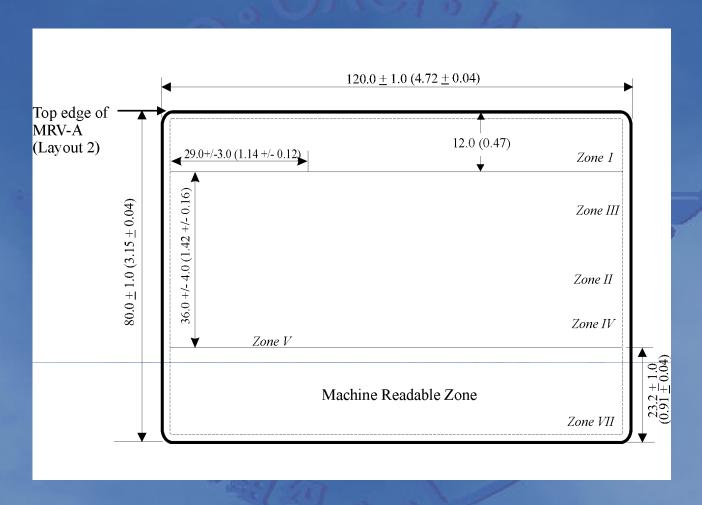
John Doe

L8988901C0XXX4009072M96121096ZE184226B<<<<<

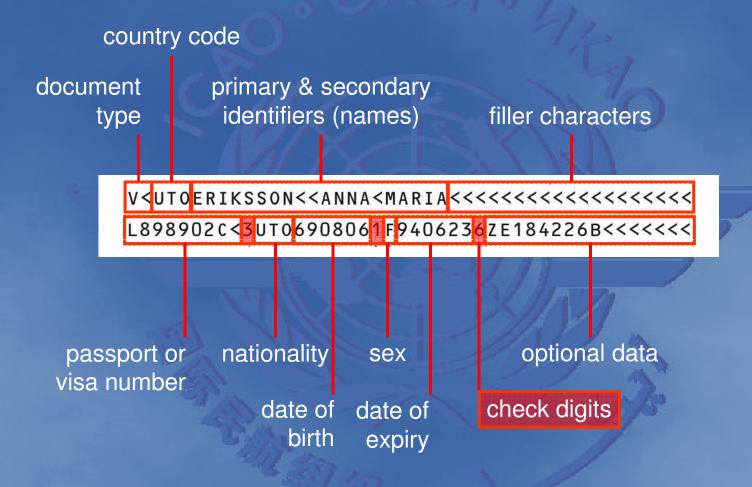
120mm

80mm

Zone boundaries: MRV-A



Machine-readable zone: MRV-A



Example of MRV-B

UTOPIA



of Issue/ Valid from/ e deliverence Valide a partir de

Lieu de deliverence ZENITH

No. of Entries/ Nombre d'entrees

MULTIPLE Type/Type

BUSINESS MULTIPLE

Surname/Nom Given names/Prenoms
ERIKSSON JOHN ARTHUR

 Passport Number
 Sex
 Date of Birth

 L898901C
 M/M
 07SEP 40

10DEC 91

Document No./ Numero de document M123889546

Issuing Officer

Nationality

XXX

John Doe

V<UTOERIKSSON<<JOHN<ARTHUR<<<<<<< L898901C<6XXX4009072M9612109<<<<<<

VISA

Valid until/ Valide jusqu'au

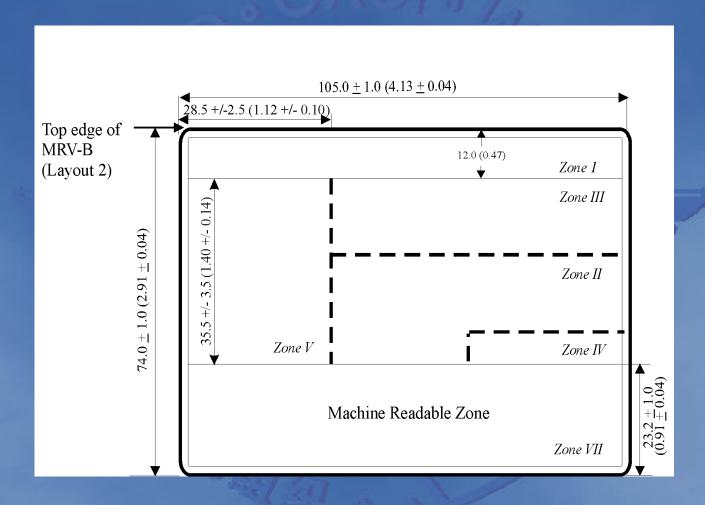
10DEC 96

7

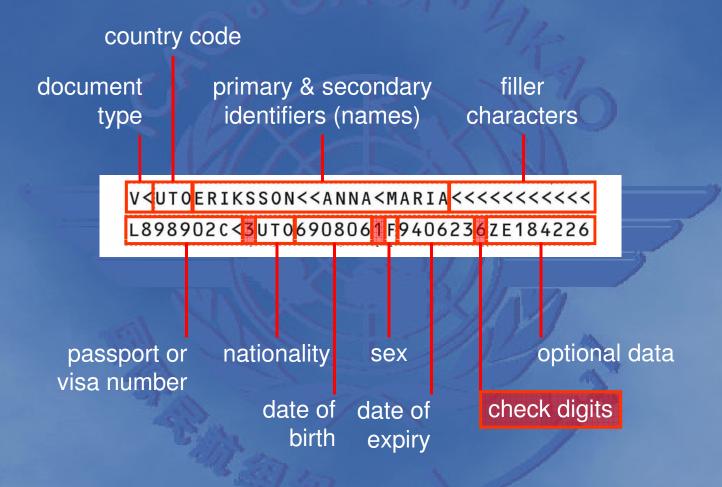
74mm

105mm

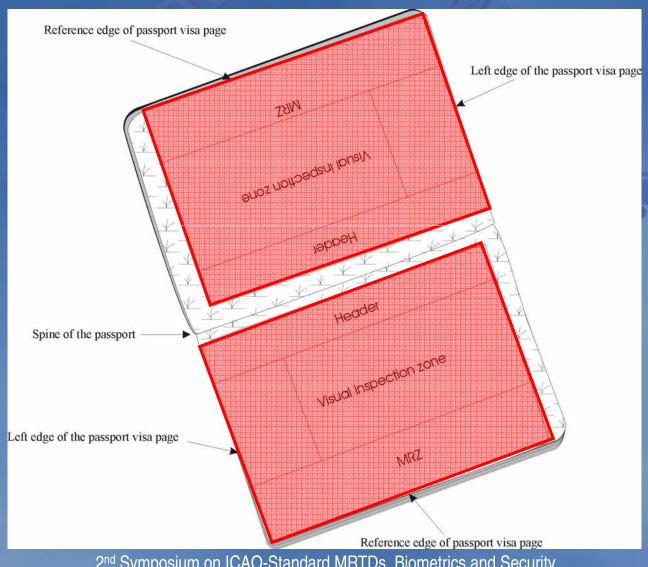
Zone boundaries: MRV-B



Machine-readable zone: MRV-B



Visa positioning in passport



European MRV

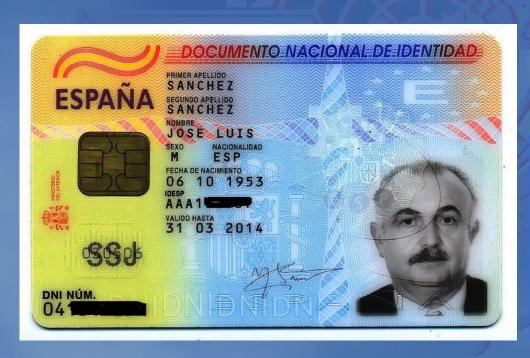


Part 3 – Official Travel Documents (cards)

- Interoperability needed
- National ID card used for travel
- Standards as for ePassports
- Part 3 currently under revision in TAG/MRTD secretariat, DCFWG finished work

Part 3 – Official Travel Documents (cards)

Currently many variations







Example of td1 (ID1-sized card)

53.98mm Front Rear

UTOPIA



UTO-MRTD

STEVENSON, PETER
Sex/ Nationality/ Date of Birth/
Sexe Nationalité Date de naissance
M/M UTO 12 JUL/JUIL 34

Doe No/N° du Doc Expiry/Expiration D23145890 12 JUL/JUIL 95

S.

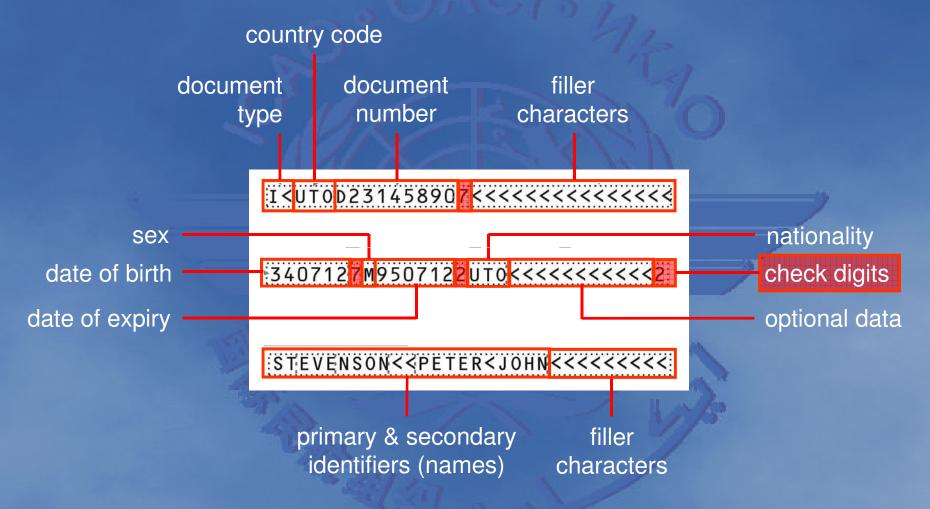
CIUTOD231458907A123X5328434D23
3407127M9507122UT0<<<<<<<<

85.60mm

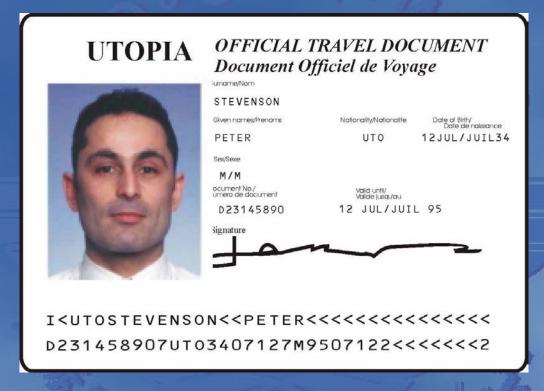
Name/Nom



Machine-readable zone: td1



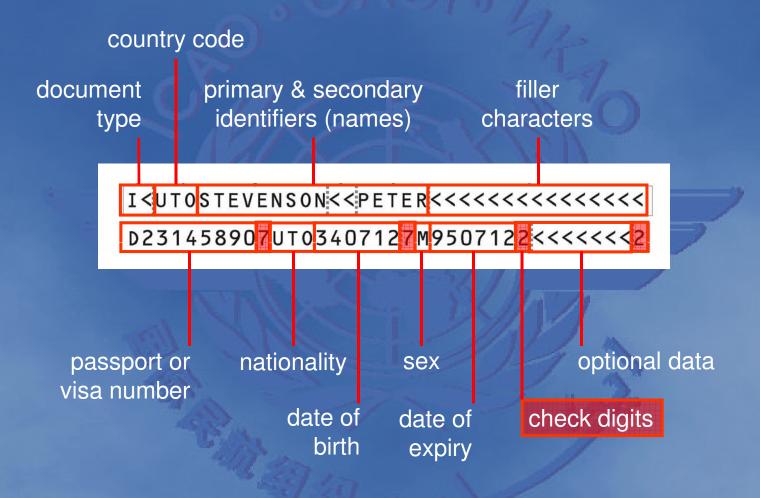
Example of td2 (ID2-sized card)



74mm

105mm

Machine-readable zone: td2



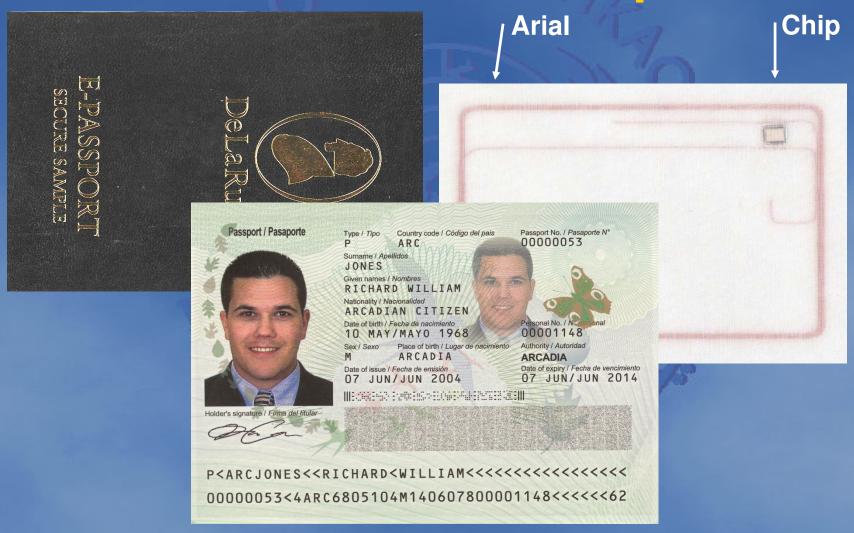
Current 9303 Part 3

- Options for expansion of machinereadable data storage:
 - >Bar codes
 - Magnetic stripes
 - Integrated circuit with contacts
 - Contactless integrated circuits
 - Optical memory

Third Edition 9303 Part 3:

- Options for expansion of machinereadable data storage:
 - Par codes
 - Magnetic stripes
 - Integrated circuit with contacts
 - Contactless integrated circuits
 - Optical memory

e MRP: Biometrics & chip



eMRTD ICAO Blueprint





- Facial image
 - > Finger Print
 - > Iris
- RF Chip (min 32K)
- **\$LDS**
- * PKI

Planning for Introduction of ePassports

- Central or decentralised issuing
- Personalisation technology location of chip
- Embassy issue repatriation
- Emergency issue ETDs
- Validity of ePassports 5 or 10 years
- Image capture Live
- Second biometric EU
- Waste levels cost
- Level of security

E MRP Readers



Machine Assisted Document Security Verification

ICAO NTWG paper on subject

- *****A structure feature
 - hologram or DOVID
- *A substance feature
 - >Inks / fibres etc
- A data feature
 - Digital security Steganography

MRP Summary

- #182 out of 190 countries issuing MRPs
- 8 countries still not issuing MRPs
- Nearly all of these countries have tenders or contracts in place
- *ICAO requirement for all countries to issue MRPs by 1st April 2010
- No non MRPs after 2015

ePassport Summary 2010

- Over 70 countries issuing ePassports out of 190
 - > 100+ By End of 2011
- 75 million ePassports issued each year out of a total of 120 million
- 21 countries have now joined the PKD
- No ICAO requirement for countries to issue ePassports

Security features

- Security must be multi-layer and the most important are the level 1 features
- The security features need to protect the holder's photograph
- Important not to obstruct the MRZ
- ePassports & biometrics just another security feature

Data page – under pressure

- The page with all the personal data and the most examined page
- It must provide protection against counterfeit and fraud, especially from desktop publishing









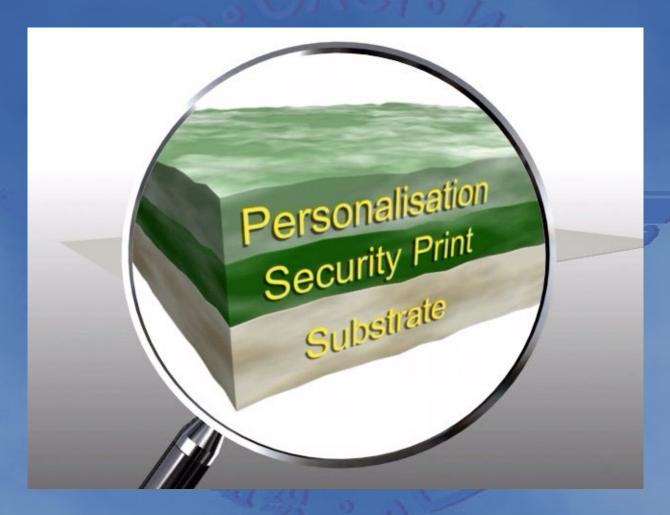
Data page – importance

- Data page is the most important page in a passport
 - >the most examined
 - >contains all the personal data
 - requires the most protection against counterfeit and fraudulent alteration

Data page – inside page



Elements



eMRTDs

I will now hand over to Robin Chalmers

EMRTD Key Elements

- Chip
- Logical Data Structure (LDS)
- Data Security
- Public Key Infrastructure

Chip

- **Reliability
- Location
- Size

Logical Data Structure

- Electronic representation of data page
- Data groups
- Future version of LDS?

Data Security

- Privacy concerns
- Skimming
- Eavesdropping
- Cloning
- Security measures

Public Key Infrastructure

- A means of establishing data is genuine
- Private and Public Keys
- Public Key Directory

Conclusion

- MRTD specifications have endured
- VIZ/MRZ remain as originally envisaged
- eMRTD is a significant step forward in travel document security

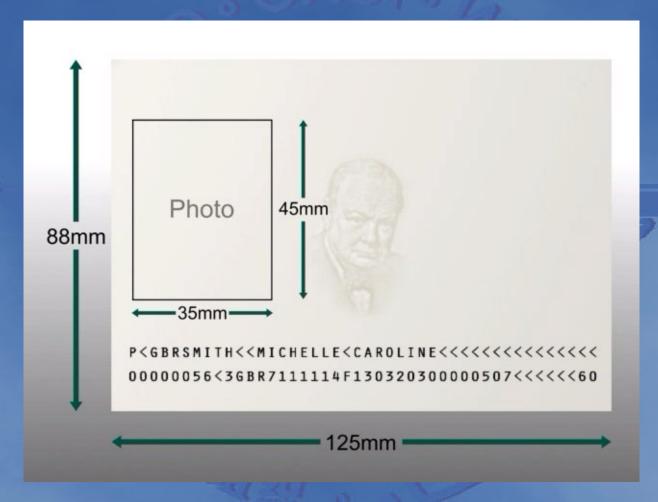
Thank You!

Malcolm Cuthbertson:

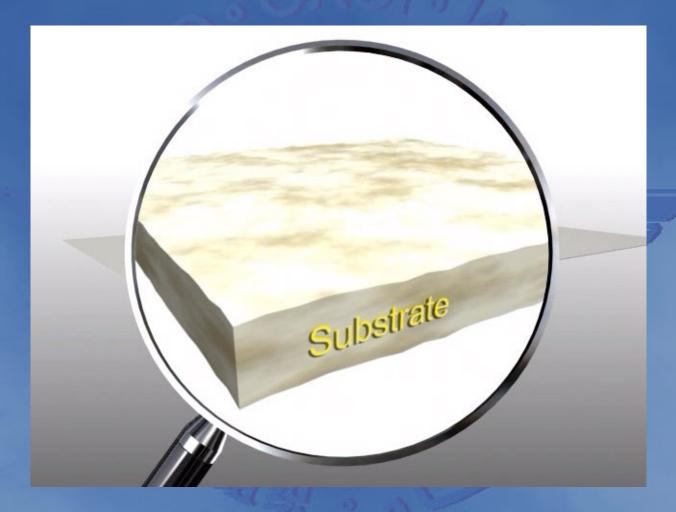
Robin Chalmers: pillhilltiscali.co.uk

Page layout & picture outline

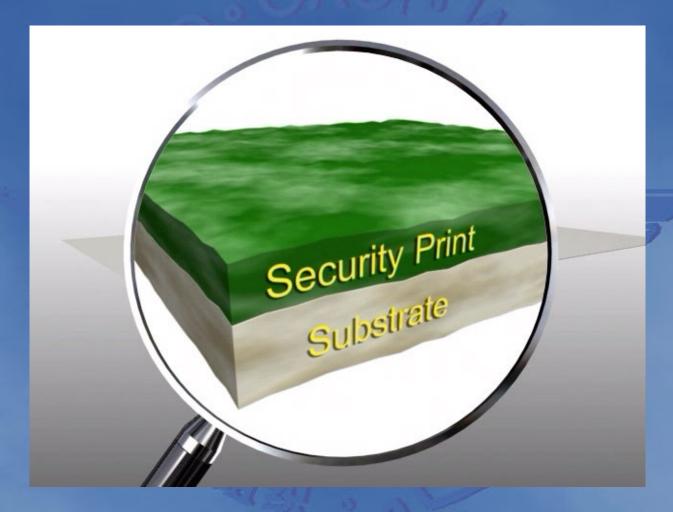
Layers



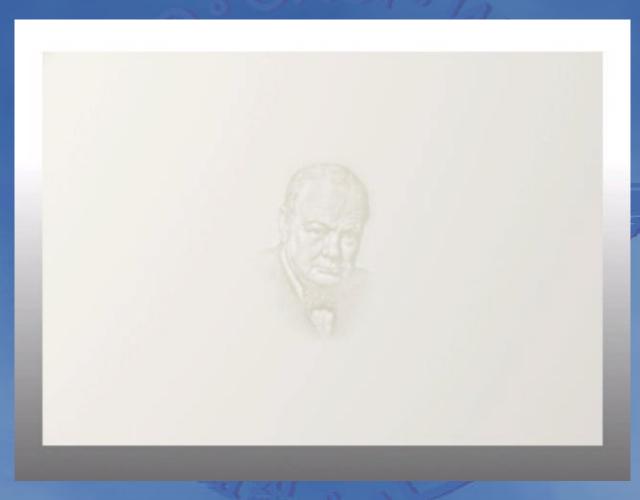
Elements



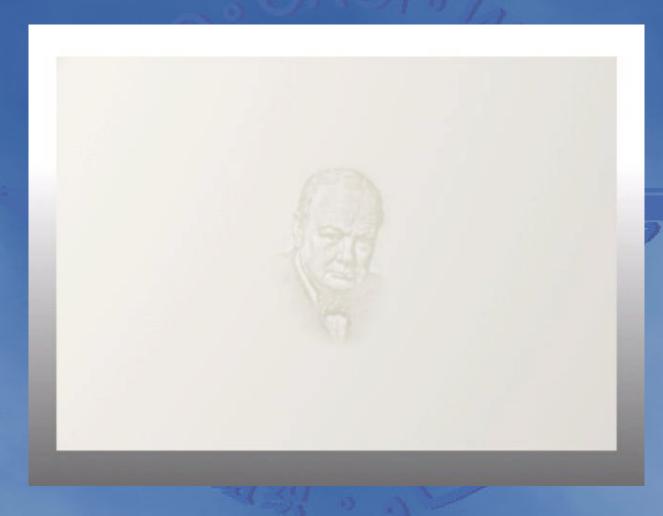
Elements



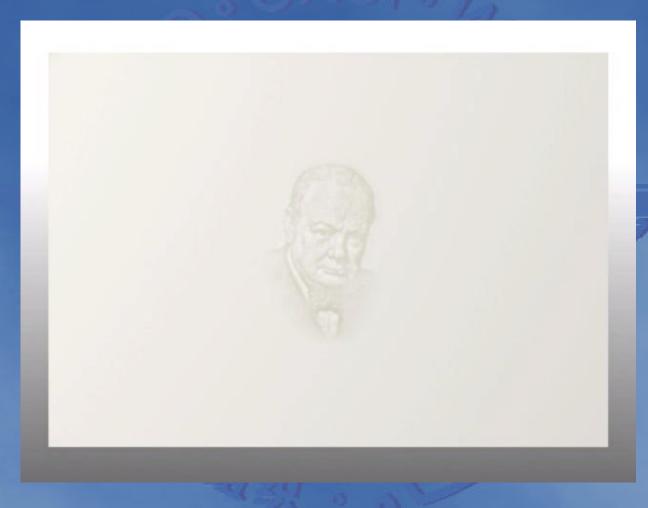
Paper substrate: UV dull



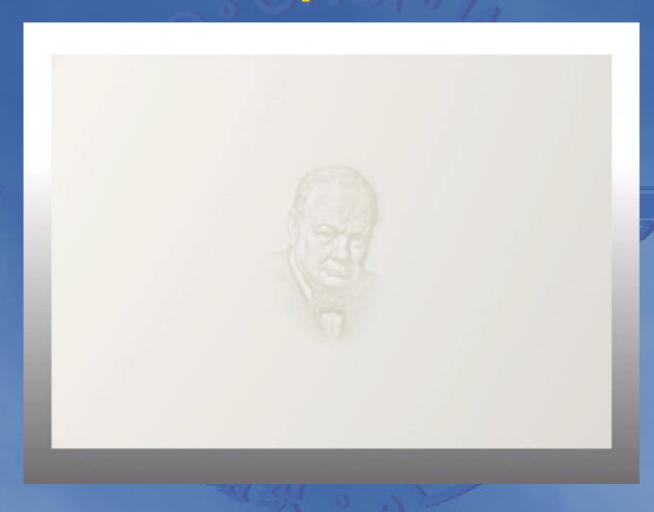
Chemical sensitisation



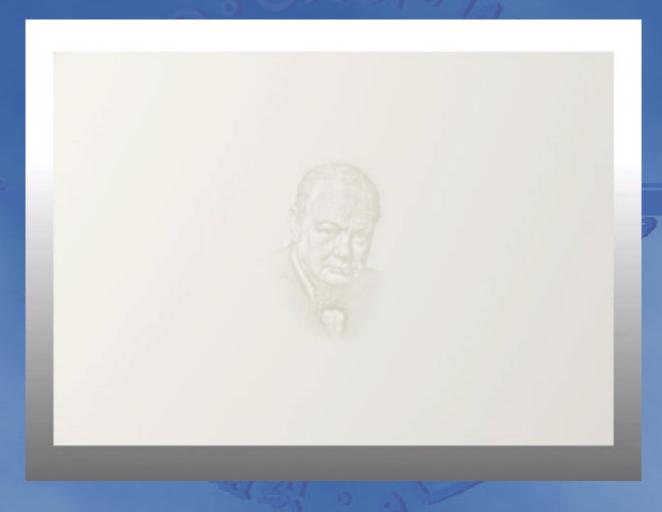
Cylinder mould watermark



Fibres & planchettes



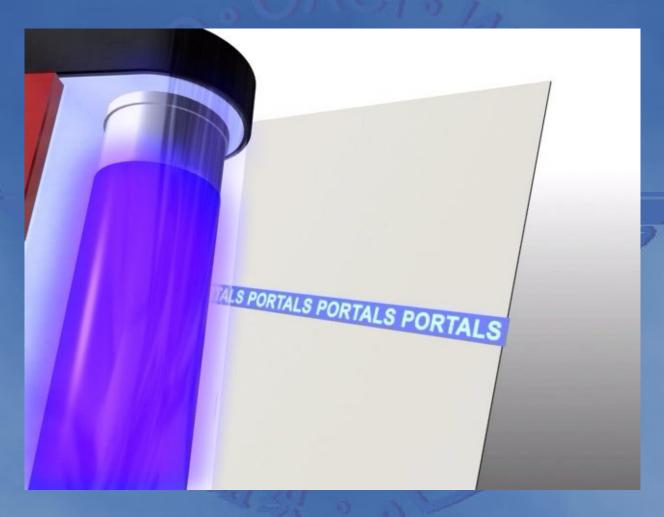
Thread



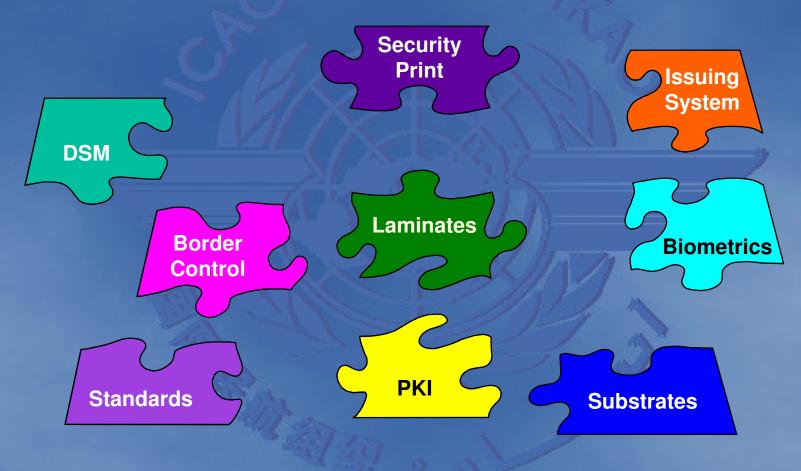
Thread



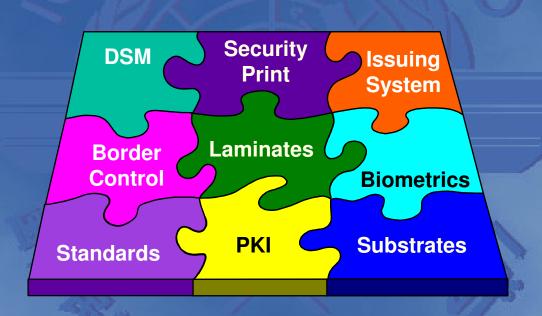
Thread



All component parts must be mutually supporting



The solution is normally a compromise



Thank you for your attention

- Malcolm CuthbertsonDe la Rue Identity Systems
- Tel: +44 (0)1256 605047
 Email:
 malcolm.cuthbertson@uk.delarue.com

What is a MRP?

Machine readable passport (MRP):

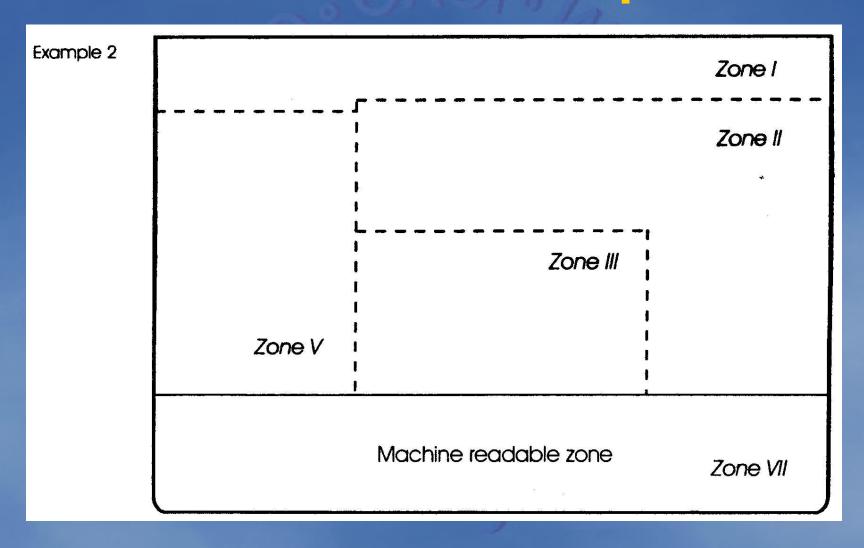
"Passport conforming with the specifications contained in Doc 9303, Part I. Normally constructed as an ID-3 size book [...]." ICAO Doc 9303, II-2

What is a MRTD?

Machine readable travel document (MRTD):

"Official document issued by a State or organisation which is used by the holder for international travel and which contains mandatory visual (eye readable) data and a separate mandatory data summary in a format which is capable of being read by machine." ICAO Doc 9303, II-2

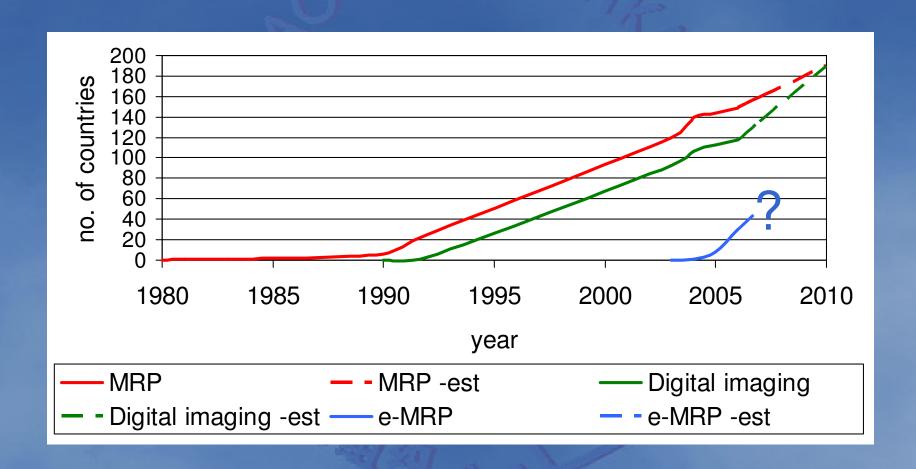
VIZ – zone location options



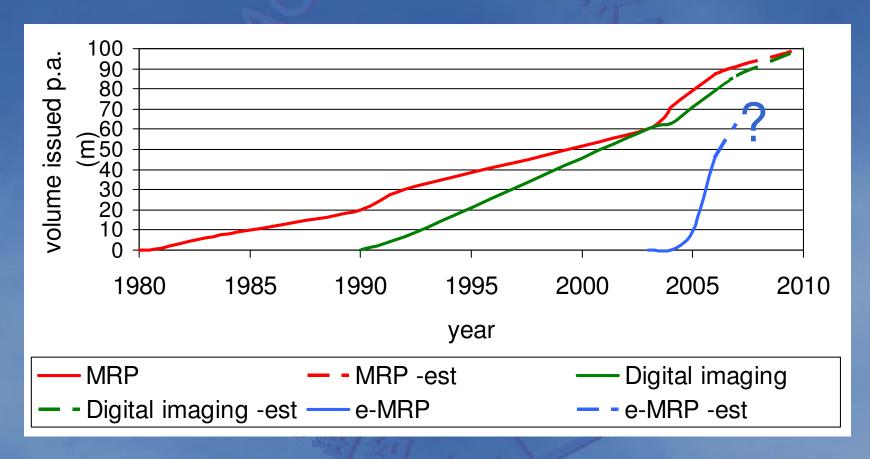
ICAO Doc 9303 Parts 1-3 interoperability

- Cultural considerations
 - >Flexibility in VIZ
 - > Truncation
 - >Transliteration
- Reader standards OCR & "e"
- Document specs; security features

Growth (no. of countries)

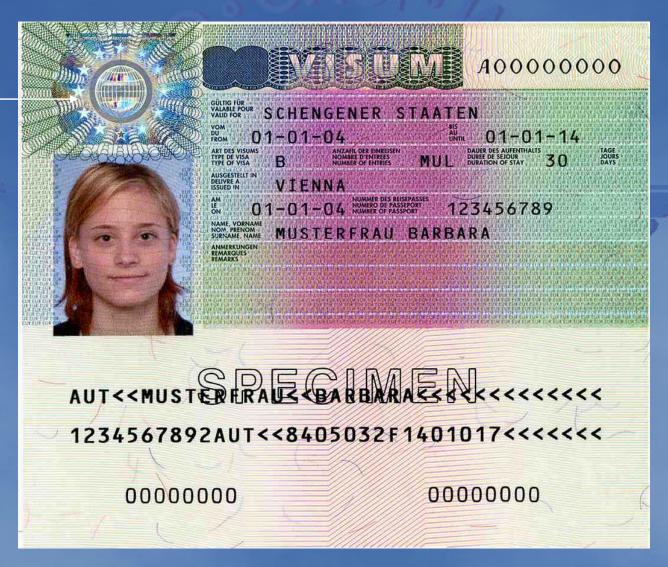


Growth (volume issued p.a.(m))



900m MRTDs in circulation worldwide

Structure Feature



Substance Feature







A Data feature



MRTD interoperability

- Standards evolved over nearly 3 decades
- Balance between facilitation and security
- Interoperability includes:
 - ►ISO standards (7501)
 - Eye readable data
 - MR data OCR B
 - PePassports
 - Biometrics
 - DSM
 - LDS/PKI

Facilitation and security

- Opposing requirements?
- 9303 recommendations on:
 - Passport security features
 - Security of issuing process